

CLAIMS

1. A secondary air supply system comprising:
 - an air pump including an electric motor and a blower;
 - 5 a secondary air path for leading the secondary air discharged from said blower to an exhaust pipe upstream of a catalyst for purifying the exhaust gas;
 - 10 an on-off valve operated to open/close said secondary air path; and
 - 15 a driving means for opening/closing the valve element of said on-off valve, wherein said driving means for opening/closing the valve element of said on-off valve includes a diaphragm unit having a diaphragm adapted to be displaced by the pressure difference between a diaphragm chamber with the discharge pressure of said blower led thereinto and an atmospheric chamber communicating with the atmosphere, and a transmission means for transmitting the displacement of said diaphragm to said valve element, and
 - 20 wherein said diaphragm chamber is arranged in the neighborhood of the outlet of said blower, and part of the air discharged from said blower flows directly into said diaphragm chamber.
2. A secondary air supply system according to claim 1,
 - 30 wherein said valve element is arranged in the neighborhood of said diaphragm, and the internal path leading from said outlet of said blower to said on-off valve has a small volume, and
 - 35 wherein a pressure sensor for detecting the pressure of said internal path is arranged in said internal path, and the operating conditions of said air pump are detected by said pressure sensor.
3. A secondary air supply system according to claim 1,

5 wherein said transmission means is a single shaft connecting said diaphragm and said valve element and arranged on the same axis as the rotary shaft of said electric motor on the air discharge side of said air pump, and

 wherein said on-off valve including said diaphragm unit and said air pump are integrated with each other.

10 4. A secondary air supply system according to claim 1,

15 wherein said valve element is arranged in such a manner as to be seated in closing contact with the side of an opening of a valve seat member downstream of the pump.

15 5. A secondary air supply system according to claim 1, further comprising at least a control relay for supplying said electric motor intermittently with the current from a DC power supply mounted on a vehicle,

20 wherein said control relay is arranged integrally with said electric motor in the neighborhood of the intake air path for leading the air from the air inlet of said air pump to the air inlet of said blower.

 6. A secondary air supply system according to claim 1,

25 wherein the surface of said valve element of said on-off valve adapted to be in closing contact with said opening is located nearer to the discharge outlet of said blower, and the other surface of said valve element is located on the exhaust side.